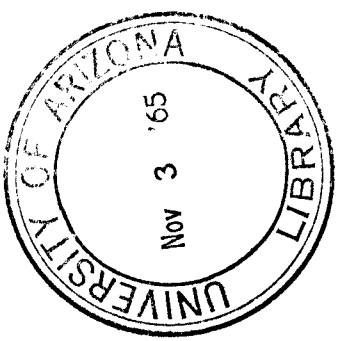
Report Number 229 September 1965

ANNUAL REPORT

1964

SHORT STAPLE COTTON BREEDING



Published by the

AGRICULTURAL EXPERIMENT STATION

The University of Arizona
Tucson, Arizona

Report Number 229 September 1965

ANNUAL REPORT

1964

SHORT STAPLE COTTON BREEDING

Published by the

AGRICULTURAL EXPERIMENT STATION

The University of Arizona
Tucson, Arizona

ACKNOWLEDGEMENTS

The authors wish to acknowledge a number of people without whose assistance this publication would not be possible. We wish to give credit to Mrs. Jack Dykeman for the fiber analyses in the laboratory; Mr. C. D. Manderscheid for assistance in preparing for plantings, harvesting, ginning, crossing, etc.; Mr. Fred Carraso for field supervision at the Yuma Experimental Farm; the farm superintendents - Mr. Harold Reyher, C. W. Fitzgibbons, Frank Pritchard, and Fred Turner, Jr. for growing the crop at their stations; the Arizona Cotton Planting Seed Distributors for their contribution in maintaining seed stocks for us, and to the numerous cotton breeders who furnished seed for testing purposes in Arizona. We wish to give recognition to the USDA - ARS Cotton Fiber Laboratory in Knoxville for the Microspinning tests and the Agricultural Engineering Department of the University of Arizona for its assistance in harvesting studies.

SHORT STAPLE COTTON BREEDING

ANNUAL REPORT

1964

The Season

1964 could hardly be called a "good" cotton year in Arizona as a whole and particularly in Maricopa, Pima, Santa Cruz, Cochise, and Greenlee counties. In these counties, the per acre yields were below that of 1963; however, in Yuma and Pinal counties the yields per acre were some of the highest ever recorded. Yuma county averaged 1586 pounds per acre. When recorded for the state as a whole, the yield per acre was 1,085 pounds as compared to 1152 for 1963.

How there can be a reduction in yield over the state as a whole, and yet an increase in two counties can possibly have several explanations. The increase in yield in Pinal and Yuma counties may be related to the fact that Deltapine Smooth Leaf and similar cottons are particularly well adapted in these areas. The overall reduction in yield in the state is probably most attributable to unfavorable weather throughout most of the growing season. The spring was cool and many fields were damaged severely with seedling diseases. The weather warmed until in July when the rains started and this wet condition continued until harvest was nearly over. Verticillium Wilt was particularly damaging at the higher altitudes, and some cotton was lost due to rot of the lower bolls in rank cotton grown at the lower altitudes.

A brief resume of the climatic conditions during the season at the locations where each of the tests were run are as follows:

1. At the Cotton Research Center, the field had been in wheat for two consecutive years prior to this crop and the soil was in excellent condition. Very good stands were obtained and the crop in early and mid-season looked

exceptionally good. Later in the season due to excessive rainfall, the cotton became rank, followed by lodging and a considerable amount of boll rot. Bollworms and stinkbugs caused considerable damage in spite of frequent applications of insecticides. Final yields were poor and plot-to-plot variation was extremely high so the yield figures were discarded as not being indicative of the potential of any cotton. For the same reason, few plant selections were made, and these were based primarily on their performance in a similar planting at Marana.

2. At the Yuma Experimental Farm, environmental conditions were more normal. The cotton did become rank, particularly the Acala types. There was considerable damp-off early and some boll rot late.

3. At the Marana Experimental Farm, the Verticillium Wilt infestation was very severe causing the yield picture to be just the reverse of that found at Yuma. The Acala types possess more tolerance to the disease and therefore out-yielded the rainbelt cottons. The growing season was very dry until late July, after which nearly 18 inches of rainfall was received at the farm. This moisture, plus cool temperature, made conditions favorable for Verticillium Wilt. This was one of the most effective years for evaluation of disease tolerance between and within the progeny rows.

4. At Safford, the test was grown on a cooperator farm. Under his system of management the stands were near perfect and insect control was exceptional. The field was defoliated in late September for an early first picking, a second harvest was made in October and the field abandoned. The U of A entry 5909 was penalized somewhat under this management as it is slightly later maturing than the other entries in the test.

The Regional Variety Tests

The western regional variety tests were grown at Yuma, Phoenix (Cotton Research Center), and Marana (Tables 1, 2, 3). At Yuma, the rainbelt

varieties in general, outyielded the Acala types. At Marana, where Verticillium Wilt was most severe, the wilt-tolerant Acala types led the test, and were definitely superior in quality at all locations. Deltapine 5540, a new wilt-tolerant commercial release, did show considerable tolerance to the disease. Deltapine 5540 is, however, somewhat more leafy and later maturing than Deltapine Smooth Leaf but does not have the quality of the Acala types (specifically fiber length and strength). The test at the Cotton Research Center was not harvested for yield but fiber laboratory data are given in Table three. Microspinning test results for samples from the three locations are given in Table one.

Strains Tests

These tests which consisted primarily of wilt-tolerant strains with Deltapine Smooth Leaf as a check variety, were also grown at Yuma, Phoenix (Cotton Research Center) and Marana. (Tables 4, 5 and 6.) Under severe wilt conditions at Marana several of the strains performed rather well and were definitely superior to the wilt susceptible check variety. At Yuma, however, none of the strains yielded as well as the check. Nine of these strains were kept to be included in an expanded testing and possible increase program in 1965. Six strains were submitted for spinning tests at Texas A & M University along with the check varieties--Acala 4-42 and Deltapine Smooth Leaf. Results of these tests are given in Table ten.

Commercial Strains Test

Advanced strains from various commercial companies were grown in this test at Cotton Research Center and Marana. (Tables 8 and 9.) Laboratory data (no yield data) only are given for the Cotton Research Center as the cotton grew too rank and the yields would have been misleading.

Stripper - Harvest Trials

Grower interests, in their desire to reduce production cost, prompted a stripper cotton variety test at both Marana and Phoenix (Cotton Research Center). The results are shown in Tables 14 and 15, and a discussion is included. It may be interesting to note that on a three-acre planting, not reported in tests, but grown on the Marana farm, a yield of 600 pounds of lint per acre was obtained with no cultivations being made, or irrigations except from rain. The cotton was planted (Deltapine Smooth Leaf) and allowed to go to harvest with no further attention except two insecticide treatments. The crop was harvested with a Heston stripper.

TABLE 1

REGIONAL VARIETY TEST

YUMA, ARIZONA - 1964

Variety	Yield Lint/acre	Bolls/lb. Seed Cotton	Lint %	FIBER MEASUREMENTS Length UHM	Length M	Strength 1/8" Pressley	Fineness Micronaire
Stoneville 7A	1537	84	37.1	1.10	.79	3.07	5.27
Deltapine 45	1490	82	37.4	1.07	.81	3.24	5.19
Deltapine 5540-85	1484	79	37.9	1.07	.79	3.27	4.12
Deltapine 5540	1473	80	39.4	1.02	.72	3.10	4.36
Stoneville 213	1426	80	37.6	1.08	.81	3.11	5.26
Deltapine SL	1317	84	38.7	1.05	.77	3.12	5.22
Hopicala	1292	67	36.6	1.11	.89	3.98	4.68
Strain A	1284	74	35.3	1.11	.88	3.67	5.13
Auburn 56	1282	77	35.1	1.02	.75	3.01	4.88
Carolina Queen	1245	78	37.3	1.09	.84	3.19	5.27
Coker 124 B	1222	76	36.7	1.08	.79	3.27	5.05
Dekalb 220	1222	73	35.7	1.03	.70	3.09	4.78
5548 (NM)	1159	69	33.5	1.14	.88	4.04	4.25
Acala 4-42	1137	63	36.8	1.12	.89	3.90	4.59
E-364 (Tex.)	1134	72	35.3	1.14	.83	3.99	4.39
Acala 66 (Calif.)	1058	66	34.3	1.08	.83	3.75	4.76
1517 D	1043	70	32.5	1.20	.93	4.05	4.59
1517 V	963	71	34.6	1.18	.91	3.99	4.31
Means	1265	75	36.1	1.10	.82	3.49	4.78
L.S.D. .05	172	4.2	.73	.026	.05	.12	.08
.01	228	5.5	.97	.034	.06	.17	.11
C.V. %	11.9	4.8	1.8	2.1	5.1	3.1	1.5

TABLE 2

REGIONAL VARIETY TEST*

COTTON RESEARCH CENTER

PHOENIX, ARIZONA - 1964

Variety	Bolls/lb. Seed Cotton	Lint %	FIBER MEASUREMENTS Length UHM	Length M	Strength 1/8" Pressley	Fineness Micronaire
1517 D	63	32.1	1.26	.97	3.79	4.55
Hopicala	61	35.6	1.15	.93	3.70	4.47
5548 (NM)	66	33.5	1.20	.92	3.74	4.23
1517 V	68	33.7	1.22	.92	3.81	4.16
E-364 (Tex.)	68	33.4	1.20	.90	3.68	4.25
Acala 4-42	60	35.3	1.14	.91	3.70	4.28
Strain A	69	34.1	1.13	.93	3.49	4.72
Acala 66 (Calif.)	60	33.4	1.17	.96	3.78	4.59
Deltapine SL	83	36.6	1.07	.81	3.14	4.88
Stoneville 7A	81	35.3	1.10	.81	3.06	4.88
Auburn 56	75	32.8	1.09	.82	3.10	4.49
Carolina Queen	76	35.5	1.09	.84	3.09	4.97
Coker 124 B	76	35.1	1.10	.83	3.21	4.71
Stoneville 213	82	35.4	1.08	.80	3.06	4.94
Deltapine 45	83	36.0	1.08	.86	3.23	4.89
Deltapine 5540	78	36.3	1.07	.75	3.12	3.98
Deltapine 5540-85	81	35.2	1.09	.77	3.40	4.00
Dekalb 220	71	34.0	1.09	.81	3.05	4.58
Means	72	34.6	1.13	.86	3.40	4.34

*Yields not reported because of extremely variable conditions.

TABLE 3

REGIONAL VARIETY TEST

MARANA, ARIZONA - 1964

STRAIN	Yield Lint/acre	Bolls/lb. Seed Cotton	Lint %	FIBER MEASUREMENTS Length UHM	Length M	Strength 1/8" Pressley	Fineness Micronaire
Deltapine 5540	1282	74	39.3	1.01	.68	3.18	4.24
E-364 (Tex.)	1219	65	36.0	1.14	.82	3.72	4.36
1517 V	1098	66	35.9	1.16	.80	3.63	4.25
Hopicala	1079	61	37.6	1.11	.84	3.86	4.57
Deltapine 45	1030	81	38.3	1.06	.74	3.12	4.60
5548 (NM)	1019	63	36.0	1.15	.88	3.65	4.42
Deltapine 5540-85	1014	76	37.7	1.05	.71	3.34	4.15
1517 D	961	63	34.1	1.21	.94	3.88	4.50
Auburn 56	922	75	35.3	1.03	.76	3.04	4.64
Coker 124 B	920	76	37.4	1.06	.74	3.18	4.49
Acala 4-42	911	57	37.8	1.09	.84	3.69	4.49
Stoneville 7A	883	82	38.7	1.06	.74	2.87	4.99
Deltapine SL	797	81	38.8	1.03	.70	3.09	4.69
Dekalb 220	790	70	36.3	1.05	.73	3.05	4.40
Carolina Queen	788	75	37.6	1.04	.71	3.11	4.67
Stoneville 213	771	82	39.3	1.04	.76	2.95	5.02
Acala 66 (Calif.)	709	63	35.9	1.10	.83	3.76	4.50
Strain A	573	74	36.1	1.05	.79	3.58	4.50
(1) Moderately severe wilt							
Means	932	71	37.1	1.08	.78	3.37	4.53
L.S.D. .05	123	3.3	.7	.02	.05	.13	.14
.01	162	4.4	.9	.03	.06	.17	.19
C.V. %	11.5	4.1	1.7	2.0	5.7	3.4	2.8

TABLE 4

U OF A PRELIMINARY STRAINS TEST

YUMA, ARIZONA - 1964

STRAIN	Yield Lint/acre	Bolls/lb. Seed Cotton	Lint %	FIBER MEASUREMENTS Length UHM	Length M	Strength 1/8" Pressley	Fineness Micronaire
Deltapine SL	1501	75	38.9	1.03	.79	3.06	5.21
Hopicala	1277	66	37.2	1.07	.85	3.81	4.57
5909-7-3	1261	66	36.1	1.12	.88	3.71	4.78
6032-7-6	1256	66	37.3	1.09	.87	3.59	4.74
5805-4-1-2	1201	64	36.2	1.11	.84	3.53	4.40
6103-27	1170	67	37.7	1.06	.85	3.64	4.69
5909-7-1	1163	70	37.4	1.09	.89	3.97	4.87
Acala 4-42	1163	63	37.9	1.10	.89	3.86	4.56
6016-11-2	1143	64	36.9	1.11	.87	3.60	4.85
5909-7-2	1137	72	37.4	1.07	.87	3.83	4.75
6019-15-5-5	1130	63	35.9	1.12	.80	3.64	4.63
6017-2-3-1	1112	72	38.3	1.12	.83	3.75	4.30
6020-9-1-2	1099	71	34.7	1.15	.94	4.04	4.37
6016-2-1-3	1088	64	37.4	1.11	.85	3.80	4.60
6016-3-5	1086	66	36.6	1.10	.86	3.86	4.83
5904-11-1-2	1083	70	37.3	1.12	.87	3.88	4.61
5915-2-7	1076	73	35.8	1.16	.92	3.78	4.61
6019-5-6-1	1070	65	37.0	1.08	.85	3.62	4.46
6024-11-1-3	1067	69	36.4	1.11	.88	3.75	4.77
6020-1-5	1057	70	36.5	1.10	.90	3.96	4.35
X2-1-6-4	1032	74	36.6	1.09	.80	3.84	4.48
6022-4-4-3	1019	76	34.8	1.09	.81	3.95	4.04
6020-9-1-1	951	72	34.5	1.12	.90	3.92	4.19
6024-2-13-1	941	69	34.0	1.07	.81	3.74	4.29
6343-3	910	72	34.8	1.14	.88	3.80	4.46
Means	1120	69	36.6	1.10	.86	3.76	4.58
L.S.D. .05	118	4.2	.82	.03	.05	.13	.11
.01	157	5.5	1.1	.04	.07	.17	.15
C.V. %	9.2	5.3	2.0	2.1	5.1	3.0	2.1

TABLE 5

U OF A PRELIMINARY STRAINS TEST*

COTTON RESEARCH CENTER

PHOENIX, ARIZONA - 1964

Variety or Strains	Bolls/lb. Seed Cotton	Lint %	FIBER MEASUREMENTS Length UHM	M	Strength 1/8" Pressley	Fineness Micronaire
5909-7-1	68	34.5	1.13	.88	3.84	4.05
5909-7-2	68	34.8	1.13	.87	3.74	4.15
5909-7-3	61	34.6	1.16	.84	3.52	4.49
5904-11-1-2	66	34.6	1.21	.91	3.56	4.24
X2-1-6-4	66	36.3	1.16	.85	3.58	4.30
6016-3-5	64	34.1	1.18	.90	3.69	4.41
6016-2-1-3	63	35.2	1.16	.85	3.57	4.25
6016-11-2	64	34.3	1.17	.88	3.61	4.53
6017-2-3-1	67	37.3	1.16	.83	3.49	4.16
6019-5-6-1	61	36.4	1.15	.89	3.37	4.47
6019-15-5-5	60	33.0	1.21	.85	3.51	4.18
6020-1-5	64	35.1	1.13	.85	3.73	4.17
6020-9-1-1	67	33.2	1.17	.91	3.45	4.23
6020-9-1-2	66	33.7	1.18	.94	3.41	4.48
6022-4-4-3	71	33.4	1.17	.87	3.66	3.79
6024-2-13-1	63	34.3	1.11	.89	3.46	4.21
6024-11-1-3	65	35.0	1.13	.83	3.50	4.32
5805-4-1-2	62	34.3	1.16	.83	3.41	4.04
5915-2-7	67	33.2	1.20	.92	3.72	4.11
6032-7-6	67	32.8	1.13	.84	3.40	3.87
6343-3	68	34.4	1.21	.94	3.48	4.29
6103-27	64	34.6	1.09	.86	3.45	4.05
Hopicala	60	35.9	1.16	.89	3.80	4.35
Acala 4-42	58	35.2	1.14	.89	3.63	4.03
Deltapine SL	80	36.1	1.08	.79	3.03	4.61
Means	65	34.7	1.16	.88	3.55	4.23

*Yields not reported because of extremely variable conditions

TABLE 6

U OF A PRELIMINARY STRAINS TEST

MARANA, ARIZONA - 1964

STRAIN	Yield Lint/acre	Bolls/lb. Seed Cotton	Lint %	FIBER MEASUREMENTS Length UHM	Length M	Strength 1/8" Pressley	Fineness Micronaire
6020-9-1-2	1277	62	36.2	1.14	.90	3.49	4.66
5915-2-7	1227	66	38.4	1.16	.93	3.61	4.97
6017-2-3-1	1154	70	38.8	1.14	.84	3.50	4.48
6024-2-13-1	1152	64	37.2	1.10	.83	3.48	4.81
6019-15-5-5	1150	62	35.6	1.17	.86	3.62	4.62
6020-9-1-1	1144	63	35.6	1.14	.91	3.42	4.54
6022-4-4-3	1130	67	37.2	1.15	.86	3.70	4.41
6016-11-2	1100	59	36.6	1.16	.93	3.48	4.89
6024-11-1-3	1088	62	36.7	1.12	.85	3.60	4.63
6343-3	1086	67	35.7	1.17	.89	3.56	4.56
6019-5-6-1	1085	63	39.0	1.14	.91	3.47	4.88
X2-1-6-4	1068	70	38.2	1.17	.89	3.57	4.75
6103-27	1049	65	37.8	1.07	.87	3.48	4.73
6016-2-1-3	1036	59	37.6	1.14	.87	3.63	4.64
6032-7-6	1029	68	36.9	1.11	.90	3.40	4.71
5909-7-2	995	68	37.9	1.11	.90	3.67	4.75
5909-7-3	995	60	38.0	1.12	.80	3.45	4.92
6020-1-5	988	66	36.9	1.12	.87	3.68	4.25
Hopicala	965	62	37.6	1.11	.85	3.72	4.50
5805-4-1-2	965	60	37.2	1.15	.84	3.45	4.19
6016-3-5	965	62	35.7	1.14	.93	3.66	4.73
5909-7-1	956	66	36.9	1.12	.93	3.93	4.61
Acala 4-42	892	60	38.1	1.09	.84	3.65	4.36
Deltapine SL	790	84	38.7	1.05	.71	3.07	4.52
5904-11-1-2	708	68	36.5	1.17	.87	3.70	4.15
Means	1040	65	37.3	1.13	.87	3.56	4.61
L.S.D. .05	108	2.6	.69	.02	.04	.10	.11
.01	144	3.4	.92	.03	.06	.13	.15
C.V. %	9.2	3.5	1.6	1.7	4.5	2.5	2.1

TABLE 7

COTTON STRAINS TEST - CURTIS FARM*

SAFFORD, ARIZONA - 1964

Variety	Yield lbs/acre	Bolls/lb. Seed Cotton	Lint %	FIBER MEASUREMENTS			
				Length		Strength	Fineness
				UHM	M	1/8" Pressley	Micronaire
Hopicala	1520	59	39.0	1.12	.85	3.66	4.19
1517C	1356	66	37.5	1.17	.85	3.69	3.86
1517D	1341	61	35.8	1.21	.89	3.77	4.22
6995 (NM)	1258	64	38.0	1.18	.89	3.70	4.21
5909 (Ariz.)	1246	64	38.1	1.10	.90	3.68	4.44
7378 (NM)	1242	66	38.5	1.17	.89	3.78	4.61
5548 (NM)	1234	65	38.1	1.18	.90	3.69	4.15
6612 (NM)	1226	63	38.1	1.19	.84	3.59	4.03
Means	1303	64	37.9	1.16	.88	3.69	4.22
L.S.D. .05	73	3.1	.60	.02	.05	.10	.09
.01	98	4.2	.80	.03	.06	.14	.12
C.V. %	4.8	4.2	1.3	1.5	4.6	2.4	1.8

*Test conducted on cooperator farm using strains from New Mexico to evaluate area adaptation.

TABLE 8

COMMERCIAL STRAINS TEST*

COTTON RESEARCH CENTER

PHOENIX, ARIZONA - 1964

Variety or Strains	Bolls/lb. Seed Cotton	Lint %	FIBER MEASUREMENTS Length UHM	M	Strength 1/8" Pressley	Fineness Micronaire
Acala 4-42	60	36.0	1.14	.94	3.74	4.31
AC241M (S. Car.)	77	38.9	1.03	.76	3.43	4.67
FTA263-20 (S. Car.)	76	30.9	1.20	.83	4.04	4.47
Dekalb 5156	63	34.1	1.15	.90	3.72	4.51
Dekalb 6-20-2	67	33.3	1.11	.86	3.18	4.72
Coker 793M1	76	35.7	1.07	.79	3.20	4.70
Coker 61-230	85	36.8	1.06	.76	2.91	5.25
Coker 62-121	73	36.5	1.08	.81	3.08	4.65
Coker 62-207	74	35.8	1.08	.78	3.13	5.02
Coker 62-215	72	36.4	1.02	.72	3.02	5.08
Deltapine 5481	86	38.3	1.03	.74	2.96	4.44
Deltapine 5658-96	81	35.6	1.09	.80	3.09	4.75
Deltapine 5717-01	86	36.0	1.10	.81	3.04	4.88
Deltapine SL	83	36.8	1.05	.77	3.14	4.80
Stoneville 7-035	85	35.0	1.11	.78	2.97	4.75
Stoneville 7-426	83	35.0	1.05	.76	2.85	4.44
Stoneville 213-245	86	34.7	1.09	.80	3.04	4.61
Stoneville 325WR	74	31.9	1.09	.81	3.08	4.38
Stoneville 508-229	81	35.7	1.08	.76	3.01	4.32
Means	77	35.4	1.09	.80	3.20	4.68

*Yields not reported because of extremely variable conditions.

TABLE 9

COMMERCIAL STRAINS TEST

MARANA - 1964 (1)

STRAIN	Yield Lint/acre	Bolls/lb. Seed Cotton	Lint %	FIBER MEASUREMENTS Length UHM	Length M	Strength 1/8" Pressley	Fineness Micronaire
Stoneville 7-426	1070	79	38.9	1.03	.72	2.81	4.70
Stoneville 508-229	1055	82	39.2	1.05	.71	2.85	4.51
Stoneville 325WR	1034	68	34.7	1.10	.81	3.08	4.40
Deltapine 5481	1019	83	40.4	1.05	.75	3.04	4.40
Stoneville 213-245	986	83	38.7	1.03	.74	2.86	4.84
Deltapine 5717-01	965	83	38.0	1.09	.81	3.04	4.69
Coker 793M1	958	73	37.5	1.08	.79	3.13	4.72
McNair 1032	948	78	36.0	1.03	.78	3.19	4.67
Dekalb 5156	915	58	36.1	1.14	.88	3.63	4.56
Deltapine 5658-96	909	80	38.6	1.07	.75	2.93	4.58
Coker 61-230	902	79	39.0	1.06	.76	2.91	5.12
Stoneville 7-035	894	82	38.0	1.10	.75	2.85	4.95
AC241M (S. Car.)	874	75	39.2	1.06	.76	3.47	4.50
Deltapine SL	855	83	39.2	1.04	.73	3.09	4.45
Dekalb 6-20-2	834	69	35.8	1.07	.76	2.98	4.76
Coker 62-207	698	76	38.2	1.05	.72	3.07	4.81
Coker 62-121	650	74	38.2	1.05	.74	3.01	4.43
FTA263-20 (S. Car.)	648	73	32.4	1.21	.84	3.69	4.36
Coker 62-215	642	73	38.0	1.04	.74	3.02	4.63
(1) Moderately severe wilt							
Means	887	77	37.7	1.07	.77	3.09	4.63
L.S.D. .05	95	3.1	.61	.033	.06	.14	.08
.01	127	4.1	.80	.044	.08	.19	.10
C.V. %	9.4	4.0	1.4	1.4	6.6	4.0	1.4

TABLE 10

SPINNING TESTS RESULTS - CARDED YARNS

MARANA, ARIZONA - 1964*

Variety	Grade	Staple	22's	50's	Strength Index	Appearance Index	Nep Count	Per Cent Waste
Acala 4-42	SLM+	1 3/32	139	53	2854	115	9	7.04
Deltapine SL	SLM	1 1/16	116	42	2326	110	13	6.75
5909-7-1 & 2	LM+	1 3/32	142	55	2937	115	14	8.23
5915-2-7	SLM+	1 5/32	144	55	2959	110	12	5.85
6016-11-2	SLM+	1 1/8	133	50	2713	110	15	6.61
6017-2-3-1	SLM+	1 1/8	138	53	2843	110	14	7.04
6020-9-1-2	SLM+	1 3/32	136	52	2796	115	7	5.00
6024-11-1-3	SLM+	1 5/32	133	50	2713	115	13	6.22

*Samples spun at Texas A & M University. Cotton grown at Marana, Arizona.

TABLE 11

MICROSPINNING TEST RESULTS - KNOXVILLE LABORATORY

REGIONAL VARIETY TESTS

ARIZONA 1964*

Variety	Yarn Strength			FIBER LENGTH									Fineness Micronaire		
				2.5% Span			50% Span			Uniformity Index					
Location*	Y	CRC	M	Y	CRC	M	Y	CRC	M	Y	CRC	M	Y	CRC	M
Auburn 56	93	113	100	1.07	1.13	1.14	.48	.52	.55	45	46	48	4.4	4.4	4.4
Deltapine SL	111	103	110	1.12	1.09	1.14	.51	.52	.54	45	47	47	4.8	4.4	4.4
Stoneville 7A	103	105	112	1.12	1.17	1.13	.51	.53	.53	45	45	47	5.0	4.7	4.7
Acala 4-42	132	132	134	1.15	1.13	1.16	.55	.54	.57	48	48	49	4.3	4.2	4.2
1517D	152	133	136	1.22	1.27	1.26	.58	.62	.64	47	48	50	4.3	4.4	4.4
Hopicala	132	131	123	1.12	1.16	1.13	.51	.57	.54	46	49	48	4.4	4.5	4.5
Strain A	125	128	118	1.12	1.17	1.11	.53	.59	.54	47	50	48	4.8	4.5	4.5
5548 (NM)	141	132	139	1.14	1.22	1.22	.50	.59	.63	44	47	51	4.0	4.4	4.4
6612 (NM)	147	143	139	1.21	1.27	1.24	.56	.63	.58	46	49	46	4.0	4.0	4.0
A 66 (Calif.)	137	130	127	1.15	1.14	1.13	.56	.53	.54	48	46	47	4.4	4.2	4.2
E 364 (Tex.)	132	128	132	1.18	1.22	1.20	.55	.57	.55	47	47	46	4.4	4.2	4.2
Average	128	125	124	1.145	1.179	1.169	.531	.564	.564	46	47	48	4.4	4.4	4.4

*All test locations. Y=Yuma, CRC=Cotton Research Center at Phoenix, M=Marana.

TABLE 12

MICROSPINNING TEST RESULTS - KNOXVILLE LABORATORY

PROGENY ROW SAMPLES - MARANA, ARIZONA - 1964*

Progeny	Yarn Strength	FIBER LENGTH		Fineness Micronaire
		2.5% Span	Uniformity Index	
690-31-5-6-1	116	1.12	49	4.6
690-31-5-6-2	116	1.12	48	4.6
690-31-5-6-4	114	1.12	49	4.8
X5804-9-5-6-2	109	1.12	48	4.6
5804-9-5-6-3	118	1.11	47	4.4
X5804-9-5-6-5	114	1.09	45	4.2
5804-9-5-6-6	119	1.14	46	4.2
5908-18-2-3	117	1.12	48	4.0
5909-7-1-1	128	1.13	48	4.3
5909-7-1-2	129	1.13	49	4.5
5909-7-1-3	126	1.13	47	4.3
5909-7-1-5	128	1.11	47	4.2
5909-7-1-8	121	1.11	48	4.5
5909-7-2-1	123	1.10	48	4.4
5909-7-2-3	119	1.13	48	4.5
5909-7-2-5	121	1.10	48	4.5
X5909-7-2-7	122	1.10	45	4.4
X5909-7-3-4	119	1.14	47	5.1
5915-2-6-1	128	1.20	47	5.5
X5915-2-6-3	119	1.17	47	4.4
5915-2-7-5	119	1.14	47	4.6
6016-2-1-2-3	128	1.21	46	4.1
6016-2-1-3-3	123	1.18	47	4.4
X6016-2-1-3-4	120	1.21	47	4.2
6016-2-1-4-2	123	1.19	47	4.1
6016-2-1-5-1	126	1.22	46	4.1
6016-2-1-5-2	128	1.20	47	4.2
6016-2-1-5-4	133	1.24	46	4.2
6016-11-2-4-1	118	1.15	46	4.6
6017-2-1-4-1	126	1.15	47	4.5
6017-2-7-3-1	117	1.14	46	4.4
6017-2-7-3-3	120	1.15	45	4.3

TABLE 12 (cont.)

Progeny	Yarn Strength	FIBER LENGTH		Fineness Micronaire
		2.5% Span	Uniformity Index	
6017-2-7-3-5	115	1.18	45	4.2
6017-2-7-4-4	123	1.18	46	4.3
X6017-4-2-5-2	110	1.14	47	4.9
X6017-4-2-5-3	104	1.10	47	4.6
X6017-10-3-6-1	106	1.09	47	4.7
6020-9-1-2-1	120	1.16	48	4.3
X6020-9-1-2-2	115	1.14	48	4.5
X6020-9-1-2-4	113	1.14	48	4.5
6020-9-1-2-6	122	1.13	48	4.2
6022-4-4-2-1	130	1.20	47	4.2
6022-4-4-2-2	125	1.19	46	4.1
6022-4-4-2-3	125	1.21	47	4.1
6022-4-4-2-4	121	1.19	48	4.3
6022-4-4-4-1	131	1.20	46	4.0
6022-4-4-4-2	131	1.18	47	4.2
6022-4-4-4-3	128	1.21	46	4.0
6022-4-4-4-4	126	1.18	46	4.0
6022-5-9-3-1	127	1.17	46	4.2
6022-5-9-3-2	119	1.19	45	4.1
X6024-2-13-1-1	121	1.13	46	4.6
X6024-11-1-2-1	110	1.12	48	4.3
X6024-11-1-2-2	103	1.14	48	4.2
X6024-11-1-2-3	109	1.12	47	4.2
X6024-11-1-2-5	113	1.12	48	4.5
6024-11-1-3-2	123	1.17	48	4.5
X6024-12-6-9-1	113	1.13	48	5.2
X6103-27-1	110	1.07	47	4.5
6103-27-2	117	1.13	47	4.5
X6010-42-6-3	103	1.05	49	4.7
X6010-42-6-7	102	1.05	49	4.4
X6010-42-6-8	110	1.07	49	4.5
6010-42-6-16	112	1.05	48	4.7
6010-42-6-18	114	1.08	50	4.7
6010-42-8-8	112	1.09	49	4.7

*Samples picked in January after considerable field exposure.
X denotes progeny numbers dropped because of fiber or other reasons.

STRIPPER HARVEST RESEARCH*

COTTON RESEARCH CENTER AND MARANA EXPERIMENTAL FARMS

1964

*The Plant Breeding Department wishes to acknowledge the cooperation of Mr. M. D. Cannon of the Department of Agricultural Engineering, for his cooperation in this project.

Tests were initiated in 1964 to investigate the possibility of growing cotton suitable for stripper harvesting. A total of eleven different varieties were grown in an effort to determine the variety or type of cotton best suited to this harvest method under Arizona conditions and assess any obvious problems of harvest. A range of varietal types from stormproof Plains cottons such as Blightmaster and Gregg 35 to typical open boll types such as Deltapine Smooth Leaf were included.

Replicated tests were grown at both the Cotton Research Center and the Marana Experiment Farm. Harvested yields, gin turnouts, and field losses for both locations are shown in Table 13. Table 14 shows the length, strength, and fineness for the various varieties grown at the Cotton Research Center.

TABLE 13

STRIPPER HARVEST TESTS

	COTTON RESEARCH CENTER						MARANA (1)		
	Harvested Yield		Gin Turnout		Field Losses (2)		Harvested Yield	Gin Turnout	Field
Variety	Spindle	Stripper	Spindle	Stripper	Spindle	Stripper	Stripper	Stripper	Losses
Deltapine SL	937	1194	35.8	26.4	23.8	12.0	1238	29.4	32.1
Deltapine 45	945	1216	33.2	22.8	26.4	14.8	1263	28.2	29.3
Lockett 4789	738	912	33.2	23.0	15.8	4.2	1111	25.2	12.7
Arizona 6010	673	953	31.9	23.9	17.9	4.6	1054	27.7	10.6
Arkansas 61-30	673	835	31.4	23.6	41.2	13.8	1185	25.7	11.4
Lankart 57	627	783	34.2	24.1	33.2	8.3	983	26.9	19.3
Paymaster 101A	539	833	31.4	21.5	30.4	12.3	1146	26.7	12.9
Blightmaster	537	810	32.0	22.7	39.2	9.2	-	-	-
Paymaster 111	534	746	31.6	20.9	34.2	11.7	-	-	-
Northern Star 5	457	777	32.6	23.8	37.6	9.2	-	-	-
Gregg 35	412	642	28.0	19.4	40.2	9.2	940	23.3	27.0

(1) Stripper only used in Marana harvest.
(2) Field losses were estimated by hand-gleaning and represent both weather losses and machine losses.

TABLE 14

STRIPPER HARVEST TESTS

COTTON RESEARCH CENTER AND MARANA EXPERIMENTAL FARM - 1964

FIBER LABORATORY DATA

Variety	COTTON RESEARCH CENTER			MARANA		
	Length UHM	Strength Pressley 1/8"	Fineness Micronaire	Length UHM	Strength Pressley 1/8"	Fineness Micronaire
Deltapine 45	1.07	3.25	4.99	1.08	3.04	4.57
Deltapine SL	1.02	3.26	4.95	1.05	3.00	4.52
Lockett 4789	1.08	3.29	5.12	1.07	2.97	4.56
Arizona 6010	1.00	3.35	5.15	1.03	3.10	4.91
Arkansas 61-30	0.95	2.97	5.72	.98	2.74	5.47
Lankart 57	0.96	2.86	5.11	1.01	2.61	4.78
Paymaster 101A	0.93	3.30	5.05	.99	2.82	4.74
Blightmaster	1.00	3.36	4.76	-	-	-
Paymaster 111	1.01	3.56	5.00	-	-	-
Northern Star 5	0.96	2.82	4.30	-	-	-
Gregg 35	0.96	3.48	4.51	1.00	3.16	4.13

Procedure at Cotton Research Center

1. Four replications planted in 8-row blocks.
2. Fifty pounds of nitrogen applied prior to first irrigation.
3. Four irrigations following planting with the last irrigation on July 30. 3.25 inches of rain received in August.
4. Two dates of harvest.
   (a) Defoliant applied September 28. Desiccant applied on plots to be stripped October 6. Harvesting by spindle machine and stripper on October 11.
   (b) Defoliant applied on October 30, by plane to remaining half of field. Desiccant applied to stripper plots on November 13. A killing frost occurred on November 17. Harvest was made on November 30.
5. Plots were hand-gleaned to determine field losses.

Observations

Even though a defoliant followed by a desiccant was used prior to the early stripping (October 12), the cotton plants were still rather green and most varieties had quite a lot of immature, unopened bolls. If early harvest is desired, adequate desiccation for stripper operation appears to be a rather difficult problem.

The cotton in this test was relatively short and yields were not high. Nevertheless, the ground speed of the stripper had to be reduced drastically in order to handle the cotton without clogging the conveyor system; otherwise, no serious trouble was experienced with the stripper at this location.

Procedure at Marana

1. One hundred pounds of nitrogen was used. Forty pounds (from Urea) was plowed under, and sixty pounds in the water after emergence.
2. Crop was mechanically thinned.
3. Four irrigations after emergence, the last on August 1; however, 13 inches of rainfall was received from July through December.
4. No defoliants were used. Harvest was delayed until December 10, following the first freeze.
5. Plots were harvested by stripper only and gleaned for field losses.

Observations

Harvest of the cottons using the commercial stripper, which was designed for Plains grown cotton, presented several problems not anticipated. The following problems were encountered:

1. The plants were too tall. The plants were bent to such an extent that the picking action of the rolls was lost. Picked locks of cotton were dropped and left hanging to the stems in the top of the plant.
2. The picking capacity of the machine was overloaded so ground speed was very slow. Conveyors were unable to move the cotton to the basket rapidly enough.
3. The basket capacity was too small.